SHARP

SUPPLEMENTAL SERVICE MANUAL

S8213R21HCPA/

LIGHT DUTY COMMERCIAL MICROWAVE OVEN

MODEL R-21JCA

In the interest of user-safety the oven should be restored to its original condition and only parts identical to those specified should be used.

WARNING TO SERVICE PERSONNEL: Microwave ovens contain circuitry capable of producing very high voltage and current. Contact with the following parts may result in a severe, possibly fatal, electrical shock. (High Voltage Capacitor, High Voltage Power Transformer, Magnetron, High Voltage Rectifier Assembly, High Voltage Harness etc..)

This is a supplemental Service Manual for Model R-21JCA. This model is quite similar to base model R-21HC. Use this supplemental manual together with the Base Model Service Manual (Reference No. is S7813R21HCP//) for complete operation, service information, etc..

TABLE OF CONTENTS

Page

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY ..... INSIDE FRONT COVER
BEFORE SERVICING ..... INSIDE FRONT COVER
WARNING TO SERVICE PERSONNEL 1
MICROWAVE MEASUREMENT PROCEDURE 2
FOREWORD AND WARNING 3
PRODUCT SPECIFICATIONS 4
OPERATION 4
SCHEMATIC DIAGRAM 5
TEST PROCEDURE 5
CONTROL PANEL ASSEMBLY 8
COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE 11
CONTROL PANEL CIRCUIT 14
PRINTED WIRING BOARD 15
PARTS LIST 16
PACKING AND ACCESSORIES 20

SHARP CORPORATION

This document has been published to be used for after sales service only.
The contents are subject to change without notice.

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(a) Do not operate or allow the oven to be operated with the door open.
(b) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary: (1) interlock operation, (2) proper door closing, (3) seal and sealing surfaces (arcing, wear, and other damage), (4) damage to or loosening of hinges and latches, (5) evidence of dropping or abuse.
(c) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.
(d) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.
(e) A microwave leakage check to verify compliance with the Federal Performance Standard should be performed on each oven prior to release to the owner.

BEFORE SERVICING

Before servicing an operative unit, perform a microwave emission check as per the Microwave Measurement Procedure outlined in this service manual.
If microwave emissions level is in excess of the specified limit, contact SHARP ELECTRONICS CORPORATION immediately @1-800-237-4277.

If the unit operates with the door open, service person should 1) tell the user not to operate the oven and 2) contact SHARP ELECTRONICS CORPORATION and The Food and Drug Administration's Center for Devices and Radiological Health immediately.

Service personnel should inform SHARP ELECTRONICS CORPORATION of any certified unit found with emissions in excess of 4mW/cm^2. The owner of the unit should be instructed not to use the unit until the oven has been brought into compliance.

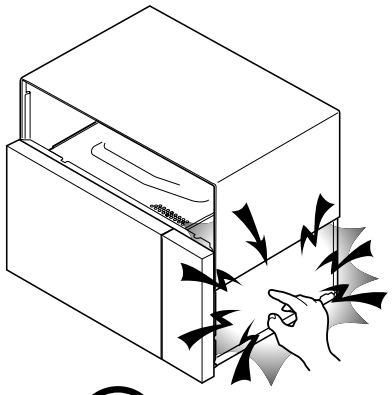
WARNING TO SERVICE PERSONNEL

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts may result in a severe, possibly fatal, electrical shock.

(Example)

High Voltage Capacitor, High Voltage Power Transformer, Magnetron, High Voltage Rectifier Assembly, High Voltage Harness etc..

Read the Service Manual carefully and follow all instructions.



Don't Touch !
Danger High Voltage

Before Servicing

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.

WARNING: RISK OF ELECTRIC SHOCK. DISCHARGE THE HIGH-VOLTAGE CAPACITOR BEFORE SERVICING.

The high-voltage capacitor remains charged about 60 seconds after the oven has been switched off. Wait for 60 seconds and then short-circuit the connection of the high-voltage capacitor (that is the connecting lead of the high-voltage rectifier) against the chassis with the use of an insulated screwdriver.

Whenever troubleshooting is performed the power supply must be disconnected. It may in, some cases, be necessary to connect the power supply after the outer case has been removed, in this event,

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect the leads to the primary of the power transformer.
5. Ensure that the leads remain isolated from other components and oven chassis by using insulation tape.
6. After that procedure, reconnect the power supply cord.

When the testing is completed,

1. Disconnect the power supply cord, and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Reconnect the leads to the primary of the power transformer.
5. Reinstall the outer case (cabinet).
6. Reconnect the power supply cord after the outer case is installed.
7. Run the oven and check all functions.

After repairing

1. Reconnect all leads removed from components during testing.
2. Reinstall the outer case (cabinet).
3. Reconnect the power supply cord after the outer case is installed.
4. Run the oven and check all functions.

Microwave ovens should not be run empty. To test for the presence of microwave energy within a cavity, place a cup of cold water on the oven turntable, close the door and set the power to HIGH and set the microwave timer for two (2) minutes. When the two minutes has elapsed (timer at zero) carefully check that the water is now hot. If the water remains cold carry out **Before Servicing** procedure and re-examine the connections to the component being tested.

When all service work is completed and the oven is fully assembled, the microwave power output should be checked and a microwave leakage test should be carried out.

MICROWAVE MEASUREMENT PROCEDURE

A. Requirements:

1) Microwave leakage limit (Power density limit): The power density of microwave radiation emitted by a microwave oven should not exceed 1mW/cm^2 at any point 5cm or more from the external surface of the oven, measured prior to acquisition by a purchaser, and thereafter (through the useful life of the oven), 5 mW/cm^2 at any point 5cm or more from the external surface of the oven.
2) Safety interlock switches: Primary interlock relay and door sensing switch shall prevent microwave radiation emission in excess of the requirement as above mentioned, secondary interlock switch shall prevent microwave radiation emission in excess of 5 mW/cm^2 at any point 5cm or more from the external surface of the oven.

B. Preparation for testing:
Before beginning the actual measurement of leakage, proceed as follows:
1) Make sure that the actual instrument is operating normally as specified in its instruction booklet.

Important:
Survey instruments that comply with the requirement for instrumentation as prescribed by the performance standard for microwave ovens, 21 CFR 1030.10(c)(3)(i), must be used for testing.

2) Place the oven tray in the oven cavity.
3) Place the load of 275±15 ml (9.8 oz) of tap water initially at 20±5˚C (68˚F) in the center of the oven cavity.
   The water container shall be a low form of 600 ml (20 oz) beaker with an inside diameter of approx. 8.5 cm (3-1/2 in.) and made of an electrically nonconductive material such as glass or plastic.
   The placing of this standard load in the oven is important not only to protect the oven, but also to insure that any leakage is measured accurately.
4) Set the cooking control on Full Power Cooking Mode.
5) Close the door and select a cook cycle of several minutes. If the water begins to boil before the survey is completed, replace it with 275 ml of cool water.

C. Leakage test:

Closed-door leakage test (microwave measurement)
1) Grasp the probe of the survey instrument and hold it perpendicular to the gap between the door and the body of the oven.
2) Move the probe slowly, not faster than 1 in./sec. (2.5 cm/sec.) along the gap, watching for the maximum indication on the meter.
3) Check for leakage at the door screen, sheet metal seams and other accessible positions where the continuity of the metal has been breached (eg., around the switches, indicator, and vents).
   While testing for leakage around the door pull the door away from the front of the oven as far as is permitted by the closed latch assembly.
4) Measure carefully at the point of highest leakage and make sure that the highest leakage is no greater than 4mW/cm^2, and that the secondary interlock switch does turn the oven OFF before any door movement.

NOTE: After servicing, record data on service invoice and microwave leakage report.

SERVICE MANUAL

SHARP

LIGHT DUTY
COMMERCIAL
MICROWAVE OVEN

R-21JCA

FOREWORD

This Manual has been prepared to provide Sharp Electronics Corp. Service Personnel with Operation and Service Information for the SHARP MICROWAVE OVEN, R-21JCA.

The model R-21JCA is quite similar to base model R-21HC (Refer No. is S7813R21HCP//).

It is recommended that service personnel carefully study the entire text of this manual and the base model's manual so that they will be qualified to render satisfactory customer service.

Check the interlock switches and the door seal carefully. Special attention should be given to avoid electrical shock and microwave radiation hazard.

WARNING

Never operate the oven until the following points are ensured.
(A) The door is tightly closed.
(B) The door brackets and hinges are not defective.
(C) The door packing is not damaged.
(D) The door is not deformed or warped.
(E) There is no other visible damage with the oven.

Servicing and repair work must be carried out only by trained service personnel.

DANGER

Certain initial parts are intentionally not grounded and present a risk of electrical shock only during servicing.
Service personnel - Do not contact the following parts while the appliance is energized;
High Voltage Capacitor, Power Transformer, Magnetron, High Voltage Rectifier Assembly, High Voltage Harness;
If provided, Vent Hood, Fan assembly, Cooling Fan Motor.

All the parts marked "*" on parts list are used at voltages more than 250V.

Removal of the outer wrap gives access to voltage above 250V.

All the parts marked "Δ" on parts list may cause undue microwave exposure, by themselves, or when they are damaged, loosened or removed.

SHARP ELECTRONICS CORPORATION

SHARP PLAZA, MAHWAH,
NEW JERSEY 07430-2135

SPECIFICATION

ITEM	DESCRIPTION
Power Requirements	120 Volts 14 Amperes 60 Hertz / Single phase, 3 wire grounded
Power Output	1000 watts (IEC 705 Test Procedure) Operating frequency of 2450MHz
Case Dimensions	Width 20-1/2" (520mm) Height 12-1/8" (309mm) Depth 16" (406mm)
Cooking Cavity Dimensions (1.0 Cubic Feet)	Width 13-7/8" (353mm) Height 8-1/8" (207mm) Depth 14-5/8" (370mm)
Control Complement	Light Up Dial (6 minutes) No cooking control
Oven Cavity Light	Yes
Safety Standard	UL Listed FCC Authorized DHHS Rules, CFR, Title 21, Chapter 1, Subchapter J, NSF Certified

OPERATION

DESCRIPTION OF OPERATING SEQUENCE

The following is a description of component functions during oven operation.

OFF CONDITION

Closing the door activates door sensing switch and secondary interlock switch. (In this condition, the monitor switch contacts are opened.)
When oven is plugged in, 120 volts A.C. is supplied to the control unit (Figure O-1).

COOKING CONDITION

When the Light Up Dial is turned, the following operations occur:

1. The contacts of relays are closed and components connected to the relays are turned on as follows. (For details, refer to Figure O-2)

RELAY	CONNECTED COMPONENTS
RY-1	Oven lamp/ Antenna motor/ Fan motor
RY-2	Power transformer

2. 120 volts A.C. is supplied to the primary winding of the power transformer and is converted to about 3.2 volts A.C. output on the filament winding, and approximately 2150 volts A.C. on the high voltage winding.
3. The filament winding voltage heats the magnetron filament and the H.V. winding voltage is sent to a voltage doubler circuit.
4. The microwave energy produced by the magnetron is channelled through the waveguide into the cavity feed-box, and then into the cavity where the food is placed to be cooked.
5. Upon completion of the cooking time, the power transformer, oven lamp, etc. are turned off, and the generation of microwave energy is stopped. The oven will revert to the OFF condition.
6. When the door is opened during a cook cycle, monitor switch, door sensing switch, secondary interlock switch, relay (RY2) and primary interlock relay(RY1) are activated with the following results. The circuits to the antenna motor, the cooling fan motor, the oven lamp and the high voltage components are de-energized, and the cooking program will be canceled when the door was opened.
7. The monitor switch electrically monitors the operation of the secondary interlock switch and primary interlock relay(RY1) and is mechanically associated with the door so that it will function in the following sequence.

(1) When the door opens from the closed position, the primary interlock relay(RY1) and secondary interlock switch open their contacts. Then the monitor switch contacts close.
(2) When the door is closed from the open position, the monitor switch contacts open first. Then the contacts of the secondary interlock switch and door sensing switch close.

If the secondary interlock switch and primary interlock relay (RY1) fail with the contacts closed when the door is opened, the closing of the monitor switch contacts will form a short circuit through the monitor fuse, secondary interlock switch, and primary interlock relay(RY1), causing the monitor fuse to blow.

SCHEMATIC
NOTE: CONDITION OF OVEN
1. LIGHT UP DIAL OFF.
2. DOOR CLOSED.

NOTE: ★ Indicates components with potential above 250 V.

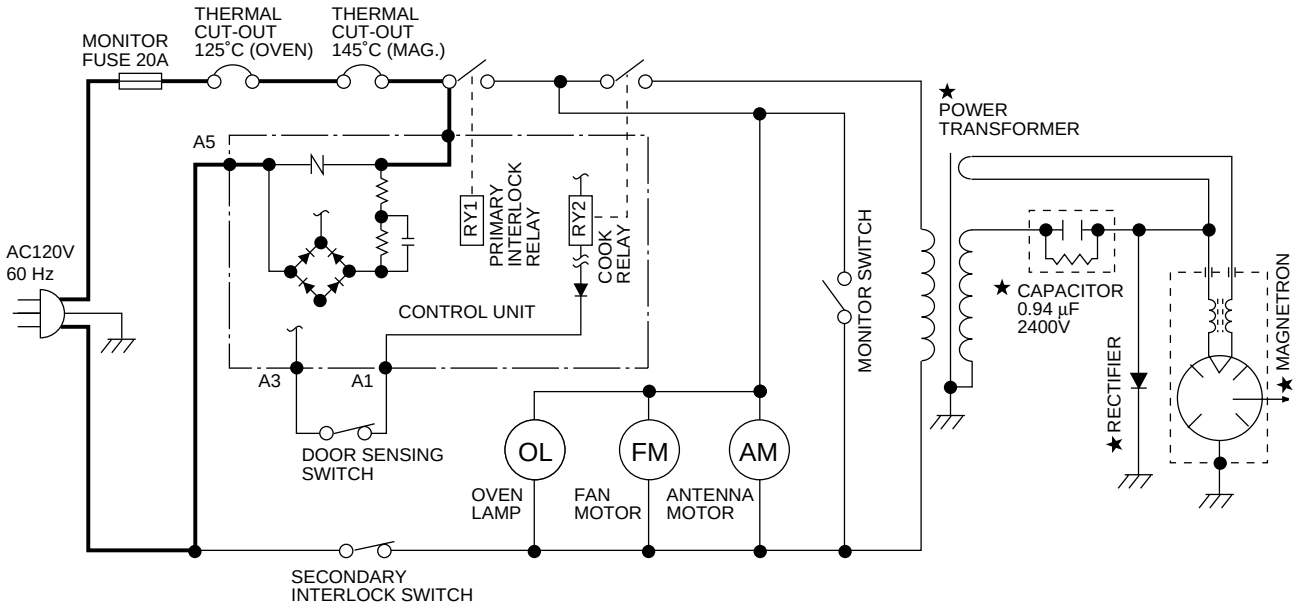


Figure O-1 Oven Schematic-OFF Condition

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST
I	**CONTROL PANEL ASSEMBLY TEST**

WARNING : To prevent an electric shock do not touch the electrical parts and the printed wiring board. Because the control unit is "TRANSLESS CIRCUIT" and many electrical parts are used at A.C. line voltage.

The control panel consists of circuits including semiconductors such as LSI, ICs, etc. Therefore, unlike conventional microwave ovens, proper maintenance cannot be performed with only a voltmeter and ohmmeter. In this service manual troubleshooting by unit replacement is described according to the symptoms indicated.

Before testing,

1) Disconnect the power supply cord and then remove outer case.
2) Open the door and block it open.
3) Discharge high voltage capacitor.
4) Disconnect the leads to the primary of the power transformer.
5) Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
6) After that procedure, re-connect the power supply cord.

1. Control Panel

The following symptoms indicate a defective control unit.

1-1 In connection with LEDs

a) At a certain LED, all or some LEDs do not light up.
b) At a certain LED, brightness is low.
c) Only one LED does not light up.
d) All or some LEDs continue to light up.
e) A certain group of LEDs do not light up.
f) The LEDs flicker.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

1-2 Other possible troubles caused by defective control unit.
- a) Buzzer does not sound or continues to sound.
- b) Clock is not possible.
- c) Cooking time can not be set.

When testing is completed,
1) Disconnect the power supply cord and then remove outer case.
2) Open the door and block it open.
3) Discharge high voltage capacitor.
4) Reconnect all leads removed from components during testing.
5) Re-install the outer case (cabinet).
6) Reconnect the power supply cord after the outer case is installed.
7) Run the oven and check all functions.

J **RELAY TEST**

1. Disconnect the power supply cord and then remove outer case.
2. Open the door and block it open.
3. Discharge high voltage capacitor.
4. Disconnect the leads to the primary of the power transformer.
5. Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
6. After that procedure, re-connect the power supply cord.
7. Remove the outer case and check voltage between Pin No. 5 of the 3 pin connector (A) and the common terminal of the relay RY1 on the control unit with an A.C. voltmeter.
   The meter should indicate 120 volts, if not check oven circuit.

RY1 AND RY2 Relay Test

These relays are operated by D.C. voltage

Check voltage at the relay coil with a D.C. voltmeter during the microwave cooking operation.

DC. voltage indicated ..... Defective relay.

DC. voltage not indicated ..... Check diode which is connected to the relay coil. If diode is good, control unit is defective.

RELAY SYMBOL	OPERATIONAL VOLTAGE	CONNECTED COMPONENTS
RY1	☞ Approx. 19.2V D.C.	Oven lamp / Antenna motor / Cooling fan motor
RY2	☞ Approx. 19.9V D.C.	Power transformer

☞The voltage under the condition when all LEDs light up.

8. Disconnect the power supply cord and then remove outer case.
9. Open the door and block it open.
10. Discharge high voltage capacitor.
11. Reconnect all leads removed from components during testing.
12. Re-install the outer case (cabinet).
13. Reconnect the power supply cord after the outer case is installed.
14. Run the oven and check all functions.

K **FOIL PATTERN ON THE PRINTED WIRING BOARD TEST**

To protect the electronic circuits, this model is provided with a fine foil pattern added to the primary on the PWB, this foil pattern acts as a fuse.

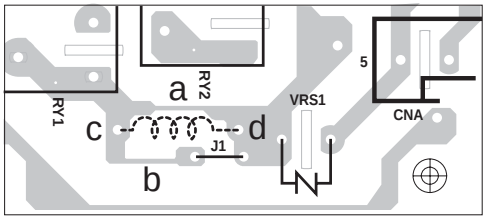
1. Foil pattern check and repairs.
   1) Disconnect the power supply cord and then remove outer case.
   2) Open the door and block it open.
   3) Discharge high voltage capacitor.
   4) Follow the troubleshooting guide given below for repair.

TEST PROCEDURES

PROCEDURE LETTER	COMPONENT TEST

STEPS	OCCURRENCE	CAUSE OR CORRECTION
1	Only pattern at "a" is broken.	*Insert jumper wire J1 and solder.
2	Pattern at "a" and "b" are broken.	*Insert the coil RCILF2003YAZZ between "c" and "d".

5) Make a visual inspection of the varistor. Check for burned damage.



6) Reconnect all leads removed from components during testing.
7) Re-install the outer case (cabinet).
8) Reconnect the power supply cord after the outer case is installed.
9) Run the oven and check all function.

2. Follow the troubleshooting guide given below, if indicator does not light up after above check and repairs are finished.
   1) Disconnect the power supply cord and then remove outer case.
   2) Open the door and block it open.
   3) Discharge high voltage capacitor.
   4) Disconnect the leads to the primary of the power transformer.
   5) Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
   6) After that procedure, re-connect the power supply cord.
   7) Follow the troubleshooting guide given below for repair.

STEPS	OCCURRENCE	CAUSE OR CORRECTION
1	The rated AC voltage is not present between Pin No. 5 of the 3-pin connector (A) and the common terminal of the relay RY1.	Check supply voltage and oven power cord.

   8) Disconnect the power supply cord and then remove outer case.
   9) Open the door and block it open.
   10) Discharge high voltage capacitor.
   11) Reconnect all leads removed from components during testing.
   12) Re-install the outer case (cabinet).
   13) Reconnect the power supply cord after the outer case is installed.
   14) Run the oven and check all functions.

CONTROL PANEL ASSEMBLY

OUTLINE OF CONTROL PANEL

Control Unit
Control unit consists of LSI, power source circuit, synchronizing signal circuit, reset circuit, buzzer circuit, encoder circuit and indicator circuit.

1) LSI
This LSI controls the encoder signal, relay driving signal for oven function, buzzer signal and LED signal.

2) Power Source Circuit
This circuit generates voltage necessary in the control unit.

Symbol	Voltage	Application
VC	+5V (*)	LSI(I-1)
VR	+20V (*)	RELAY(RY1, RY2)

(*) The voltage under the condition when all LEDs light up. The voltage VR will vary according to the quantity of the LEDs which light up.

3) Synchronizing Signal Circuit
The power source synchronizing signal is available in order to compose a basic standard time in the clock circuit. It accompanies a very small error because it works on commercial frequency.

4) Reset Circuit
A circuit to generate a signals which resets the LSI to the initial state when power is supplied.

5) Buzzer Circuit
The buzzer is responsive to signals from the LSI to emit audible sounds (completion sound).

6) Door Sensing Switch
A switch to “tell” the LSI if the door is open or closed.

7) Relay Circuit
To drive the magnetron, fan motor, antenna motor and light the oven lamp.

8) Encoder
The encoder generates the pulse signal, and the pulse signal is sent to the LSI.

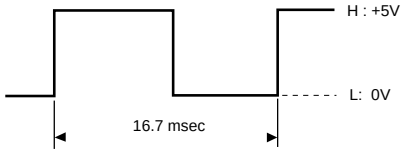
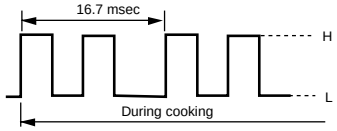
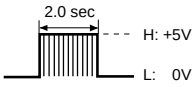
9) Indicator Circuit
Indicator elements are the Light-emitting diodes (LD1-LD20).
This circuit consists of 4-digits and 5 segments.

DESCRIPTION OF LSI

LSI (IXA167DR)

The I/O signal of the LSI (IXA167DR) are detailed in the following table.

Pin No.	Signal	I/O	Description
1	D3	OUT	**Segment data signal.** Signal is input to the cathodes of the light-emitting diodes (LD1, LD6, LD11 and LD16).
2	D4	OUT	**Digit selection signal.** Signal is input to the anodes of the light-emitting diodes (LD16 - LD20).
3	D5	OUT	**Digit selection signal.** Signal is input to the anodes of the light-emitting diodes (LD11 - LD15).
4	D6	OUT	**Digit selection signal.** Signal is input to the anodes of the light-emitting diodes (LD6 - LD10).
5	D7	OUT	**Digit selection signal.** Signal is input to the anodes of the light-emitting diodes (LD1 - LD5).
6	P20	IN	Connected to VDD terminal.
7	P21	IN	Connected to VSS terminal.
8	P22	IN	**Signal coming from encoder.** When the encoder is turned, the contacts of encoder make pulse signals. And pulse signals are input into P22.

Pin No.	Signal	I/O	Description
9	$\overline{\text{RESET}}$	IN	**Auto clear terminal.** Signal is input to reset the LSI to the initial state when power is applied. Temporarily set to "L" level the moment power is applied, at this time the LSI is reset. Thereafter set at "H" level.
10	CNVSS	IN	**Power source voltage.** The power source voltage to drive the LSI is input to CNVSS terminal.
11	XOUT	OUT	**Internal clock oscillation frequency control output.** Output to control oscillation input of XIN.
12	XIN	IN	**Internal clock oscillation frequency input setting.** The internal clock frequency is set by inserting the ceramic filter oscillation circuit with respect to XOUT terminal.
13	VSS	IN	**Power source voltage: 0V.** The power source voltage to drive the LSI is input to VSS terminal. Connected to VC.
14	VDD	IN	**Power source voltage: +5V.** The power source voltage to drive the LSI is input to VDD terminal.
15	N.F	IN	Connected to VSS terminal.
16	INT0	IN	**Signal coming from encoder.** Signal similar to P22. Pulse signals are input into INT0.
17	INT1	IN	**Signal to synchronize LSI with commercial power source frequency.** This is basic timing for all real time processing of LSI. 
18	AIN0	IN	**Input signal which communicates the door open/close information to LSI.** Door closed; "L" level signal. Door opened; "H" level signal.
19-21	AIN1-AIN3	IN	**Terminal to change functions according to the model.** Signal in accordance with the model in operation is applied to set up its function.
22	P00	OUT	Terminal not used.
23	P01	OUT	**Magnetron high-voltage circuit driving signal.** To turn on and off the cook relay (RY2). In 100% power operation, the signals hold "H" level during microwave cooking and "L" level while not cooking.
24	P02	OUT	**Oven lamp, turntable motor and fan motor driving signal(Square Waveform : 60Hz).** To turn on and off shut-off relay (RY1). The square waveform voltage is delivered to the relay (RY1) driving circuit and relay(RY2) control circuit. 
25	P03	OUT	**Signal to sound buzzer.** Completion sound. 
26	P10	OUT	Terminal not used.
27-29	P11-P13	OUT	**Segment data signal.** Signal is input to the cathodes of the light-emitting diodes (LD5, LD10, LD15 and LD20).
30	D0	OUT	**Segment data signal.** Signal is input to the cathodes of the light-emitting diodes (LD4, LD9, LD14 and LD19).
31	D1	OUT	**Segment data signal.** Signal is input to the cathodes of the light-emitting diodes (LD3, LD8, LD13 and LD18).
32	D2	OUT	**Segment data signal.** Signal is input to the cathodes of the light-emitting diodes (LD2, LD7, LD12 and LD17).

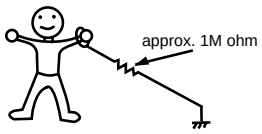
SERVICING

1. Precautions for Handling Electronic Components

This unit uses CMOS LSI in the integral part of the circuits. When handling these parts, the following precautions should be strictly followed. CMOS LSI have extremely high impedance at its input and output terminals. For this reason, it is easily influenced by the surrounding high voltage power source, static electricity charge in clothes, etc., and sometimes it is not fully protected by the built-in protection circuit.

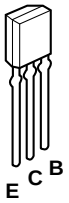
In order to protect CMOS LSI.

1) When storing and transporting, thoroughly wrap them in aluminium foil. Also wrap PW boards containing them in aluminium foil.
2) When soldering, ground the technician as shown in the figure and use grounded soldering iron and work table.



2. Shapes of Electronic Components

Transistor
KTA1504SGRRTK
KRC105S
KRA101S
KRC101S



Transistor
KTC3198A

3. Servicing of Touch Control Panel

We describe the procedures to permit servicing of the touch control panel of the microwave oven and the precautions you must take when doing so. To perform the servicing, power to the touch control panel is available either from the power line of the oven itself or from an external power source.

(1) Servicing the touch control panel with power supply of the oven :

CAUTION:
THE HIGH VOLTAGE TRANSFORMER OF THE MICROWAVE OVEN IS STILL LIVE DURING SERVICING AND PRESENTS A HAZARD .

Therefore, before checking the performance of the touch control panel,

1) Disconnect the power supply cord and then remove outer case.
2) Open the door and block it open.
3) Discharge high voltage capacitor.
4) Disconnect the leads to the primary of the power transformer.
5) Ensure that these leads remain isolated from other components and oven chassis by using insulation tape.
6) After that procedure, re-connect the power supply cord.

After checking the performance of the touch control panel,

1) Disconnect the power supply cord.
2) Open the door and block it open.
3) Re-connect the leads to the primary of the power transformer.
4) Re-install the outer case (cabinet).
5) Re-connect the power supply cord after the outer case is installed.
6) Run the oven and check all functions.

A. On some models, the power supply cord between the touch control panel and the oven itself is so short that the two can't be separated. For those models, check and repair all the controls (sensor-related ones included) of the touch control panel while keeping it connected to the oven.

B. On some models, the power supply cord between the touch control panel and the oven proper is so long enough that they may be separated from each other. For those models, therefore, it is possible to check and repair the controls of the touch control panel while keeping it apart from the oven proper; in this case you must short both ends of the door sensing switch (on PWB) of the touch control panel with a jumper, which brings about an operational state that is equivalent to the oven door being closed. As for the sensor-related controls of the touch control panel, checking them is possible if the dummy resistor(s) with resistance equal to that of the controls are used.

(2) Servicing the touch control panel with power supply from an external power source:

Disconnect the touch control panel completely from the oven proper, and short both ends of the door sensing switch (on PWB) of the touch control panel, which brings about an operational state that is equivalent to the oven door being closed. Connect an external power source to the power input terminal of the touch control panel, then it is possible to check and repair the controls of the touch control panel; it is also possible to check the sensor-related controls of the touch control panel by using the dummy resistor(s).

4. Servicing Tools

Tools required to service the touch control panel assembly.

1) Soldering iron: 30W
   (It is recommended to use a soldering iron with a grounding terminal.)
2) Oscilloscope: Single beam, frequency range: DC - 10MHz type or more advanced model.
3) Others: Hand tools

5. Other Precautions

1) Before turning on the power source of the control unit, remove the aluminium foil applied for preventing static electricity.
2) Connect the connector of the key unit to the control unit being sure that the lead wires are not twisted.
3) After aluminium foil is removed, be careful that abnormal voltage due to static electricity etc. is not applied to the input or output terminals.
4) Attach connectors, electrolytic capacitors, etc. to PWB, making sure that all connections are tight.
5) Be sure to use specified components where high precision is required.

COMPONENT REPLACEMENT AND ADJUSTMENT PROCEDURE

WARNING AGAINST HIGH VOLTAGE:

Microwave ovens contain circuitry capable of producing very high voltage and current, contact with following parts may result in severe, possibly fatal, electric shock.
(Example)
High Voltage Capacitor, Power Transformer, Magnetron, High Voltage Rectifier Assembly, High Voltage Harness etc..

WARNING: **Avoid possible exposure to microwave energy. Please follow the instructions below before operating the oven.**

1. Disconnect the power supply cord.
2. Visually check the door and cavity face plate for damage (dents, cracks, signs of arcing etc.).

Carry out any remedial work that is necessary before operating the oven.
Do not operate the oven if any of the following conditions exist;
1. Door does not close firmly.
2. Door hinge, support or latch hook is damaged.
3. The door gasket or seal is damaged.
4. The door is bent or warped.
5. There are defective parts in the door interlock system.
6. There are defective parts in the microwave generating and transmission assembly.
7. There is visible damage to the oven.

Do not operate the oven:
1. Without the RF gasket (Magnetron).
2. If the wave guide or oven cavity are not intact.
3. If the door is not closed.
4. If the outer case (cabinet) is not fitted.

WARNING FOR WIRING

To prevent an electric shock, take the following precautions.
1. Before wiring,
   1) Disconnect the power supply cord.
   2) Open the door and block it open.
   3) Discharge the high voltage capacitor and wait for 60 seconds.
2. Don't let the wire leads touch to the followiong parts;
   1) High voltage parts:
      Magnetron, High voltage transformer, High voltage capacitor and High voltage rectifier assembly.
   2) Hot parts:
      Oven lamp, Magnetron, High voltage transformer, and Oven cavity.
   3) Sharp edge:
      Bottom plate, Oven cavity, Waveguide flange, Chassis support and other metallic plate.
   4) Movable parts (to prevent a fault)
      Fan blade, Fan motor, Switch, Switch lever and antenna motor.
3. Do not catch the wire leads in the outer case cabinet.
4. Insert the positive lock connector until its pin is locked and make sure that the wire leads do not come off even if the wire leads are pulled.
5. To prevent an error function, connect the wire leads correctly, referring to the Pictorial Diagram.

Please refer to 'OVEN PARTS, CABINET PARTS, CONTROL PANEL PARTS, DOOR PARTS', when carrying out any of the following removal procedures:

DOOR PARTS REMOVAL

CHOKE COVER
1. Disconnect the power supply cord.
2. Open the door slightly.
3. Insert a putty knife (thickness of about 0.5mm) into the gap between the choke cover and door frame as shown in Figure C-6 to free engaging parts.
4. Pry the choke cover by inserting a putty knife as shown in Figure C-6.
5. Release choke cover from door panel.
6. Now choke cover is free.

NOTE: When carrying out any repair to the door, do not bend or warp the slit choke (tabs on the door panel assembly) to prevent microwave leakage.

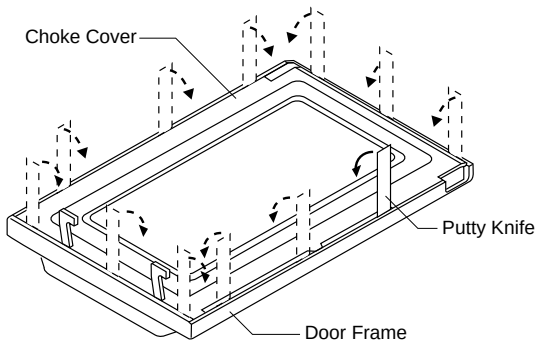


Figure C-6. Door Disassembly

7. Release two (2) pins of door panel from two (2) holes of upper and lower oven hinges by lifting up.
8. Now, door sub assembly is free from oven cavity.

DOOR PANEL REMOVAL

9. Remove the four (4) screws holding the door panel to the door frame.
10. Release door panel from seven (7) tabs of door frame by sliding door panel downward.
11. Now, the door panel is free.

DOOR HANDLE REMOVAL

12. Release the latch spring from the tab of the latch angle assembly.
13. Remove the two (2) screws holding the door handle and the latch angle assembly through the door frame.
14. Now, door handle is free.

LATCH HEADS REMOVAL

15. Remove the one (1) screw holding the latch angle assembly to the door frame.
16. Remove the latch angle assembly together with the latch lever, latch spring and the upper and lower latch heads from the door frame.
17. Release the latch lever together with the latch spring and the latch heads from the latch angle assembly.
18. Release the two (2) latch heads from the latch lever.
19. Now, the upper and lower latch heads are free.

FRONT DOOR GLASS OR SEALER PLATE REMOVAL

(After DOOR PANEL REMOVAL**)**

12. Remove the four (4) screws holding the glass stopper U to the door frame and remove the glass stopper U.
13. Remove the two (2) screws holding the glass stopper R to the door frame and remove the glass stopper R.
14. Slide the front door glass and the sealer plate left at first and then slide upwards to release them from the tabs holding it.
17. Now, the front door glass or the sealer plate free.

DOOR CASE REMOVAL

(After DOOR PANEL REMOVAL**)**

12. Straighten all tabs of the door case holding the door case to the door frame.
13. Release door case from the door frame.
17. Now, the door case is free

NOTE: At this moment, the door badge is attached on the door case.

RE-INSTALL OF THE DOOR

1. Re-install all door parts except the choke cover.
2. Catch two (2) pins of door panel on two (2) holes of upper and lower oven hinges.
3. Re-install choke cover to door panel by pushing.

NOTE: After any service to the door;

(A) Make sure that door sensing switch and secondary interlock switch are operating properly. (Refer to chapter "Test Procedures".).

(B) An approved microwave survey meter should be used to assure compliance with proper microwave radiation emission limitation standards. (Refer to Microwave Measurement Procedure.)

After any service, make sure of the following :

1. Door latch heads smoothly catch latch hook through latch holes and that latch head goes through center of latch hole.
2. Deviation of door alignment from horizontal line of cavity face plate is to be less than 1.0mm.
3. Door is positioned with its face pressed toward cavity face plate.
4. Check for microwave leakage around door with an approved microwave survey meter. (Refer to Microwave Measurement Procedure.)

Note: The door on a microwave oven is designed to act as an electronic seal preventing the leakage of microwave energy from oven cavity during cook cycle. This function does not require that the door be air-tight, moisture (condensation)-tight or light-tight. Therefore, occasional appearance of moisture, light or sensing of gentle warm air movement around oven door is not abnormal and do not in themselves indicate a leakage of microwave energy from oven cavity.

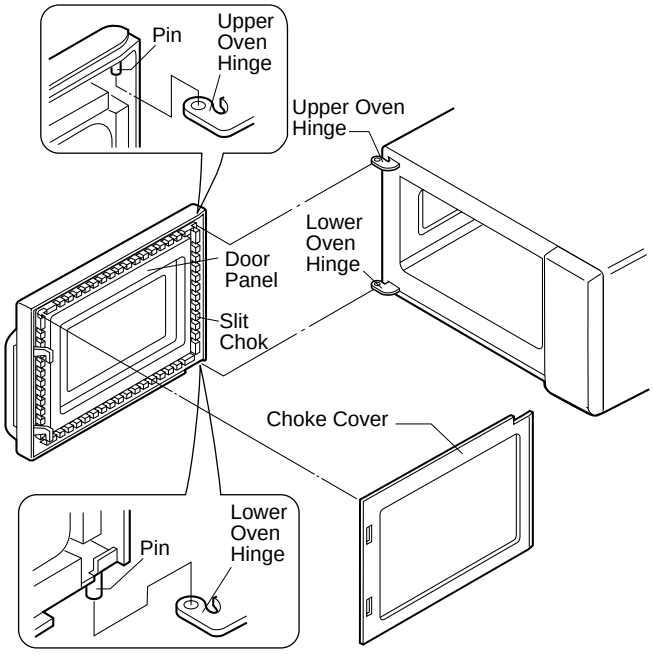


Figure C-7. Door Replacement

ANTENNA MOTOR SHAFT REPLACEMENT

REMOVAL

1. Disconnect the power supply cord.
2. Open the door and block it open.
3. To discharge the high voltage capacitor, wait for 60 seconds.
4. Remove the antenna motor from the oven cavity bottom

plate, referring to "ANTENNA MOTOR REMOVAL" .

5. Remove the ceramic shelf from the oven cavity bottom plate.
6. Remove the one (1) screw and the one (1) washer holding the antenna holder of the stirrer antenna assembly to the oven cavity bottom plate through the square hole of the stirrer antenna. Refer to Figure C-8.
7. Release the antenna holder from the one (1) tab of the oven cavity bottom plate.
8. Remove the stirrer antenna assembly from the oven cavity bottom plate.
9. Remove the antenna motor shaft from the hole of the oven cavity bottom plate.
10. Now, the antenna motor shaft is free.

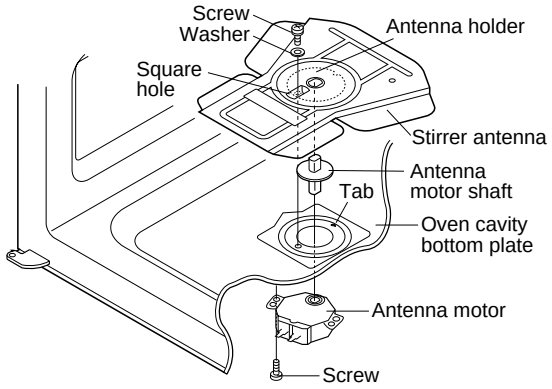


Figure C-8. Antenna Motor Shaft Removal

INSTALLATION

1. Install the antenna motor shaft into the hole of the oven cavity bottom plate, and turn the flat faces of antenna motor shaft to the left and right side walls of oven cavity (to fit the stirrer antenna holder). Refer to Figure C-9.
2. Set the direction of the stirrer antenna and antenna holder so that the hole of the antenna holder fit to the centre of the stirrer antenna's big blade. Refer to Figure C-9.
3. Hook the hole of the antenna holder on the tab of the oven cavity bottom plate. Refer to Figure C-10.
4. Insert the antenna holder into the hole of the oven cavity bottom plate and fit the hole of the antenna holder with an antenna motor shaft. Refer to Figure C-10.
5. Install the antenna holder to the oven cavity bottom plate with the one (1) screw and the one (1) washer. Refer to Figure C-8.
6. Install the antenna motor to the oven cavity bottom plate with one (1) screw. Refer to Figure C-8.
7. Connect the wire leads to the antenna motor, referring to the pictorial diagram.
8. Install the base plate cover to the base plate with one (1) screw.
9. Install the ceramic shelf to the oven cavity bottom plate. Refer to "INSTALLATION OF CERAMIC SHELF" .

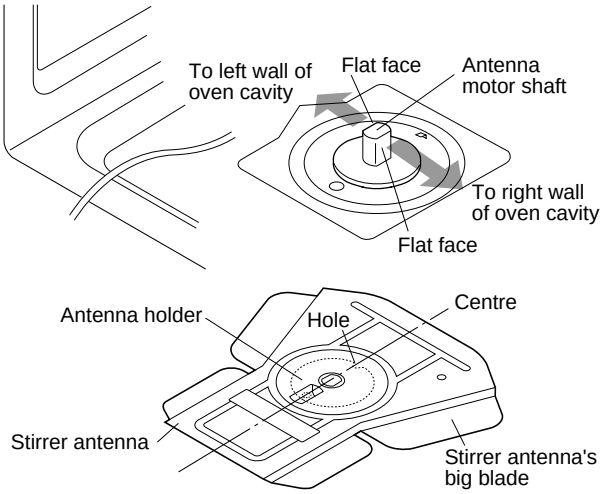


Figure C-9. Derection of Antenna Motor Shaft and Stirrer Antenna Assembly

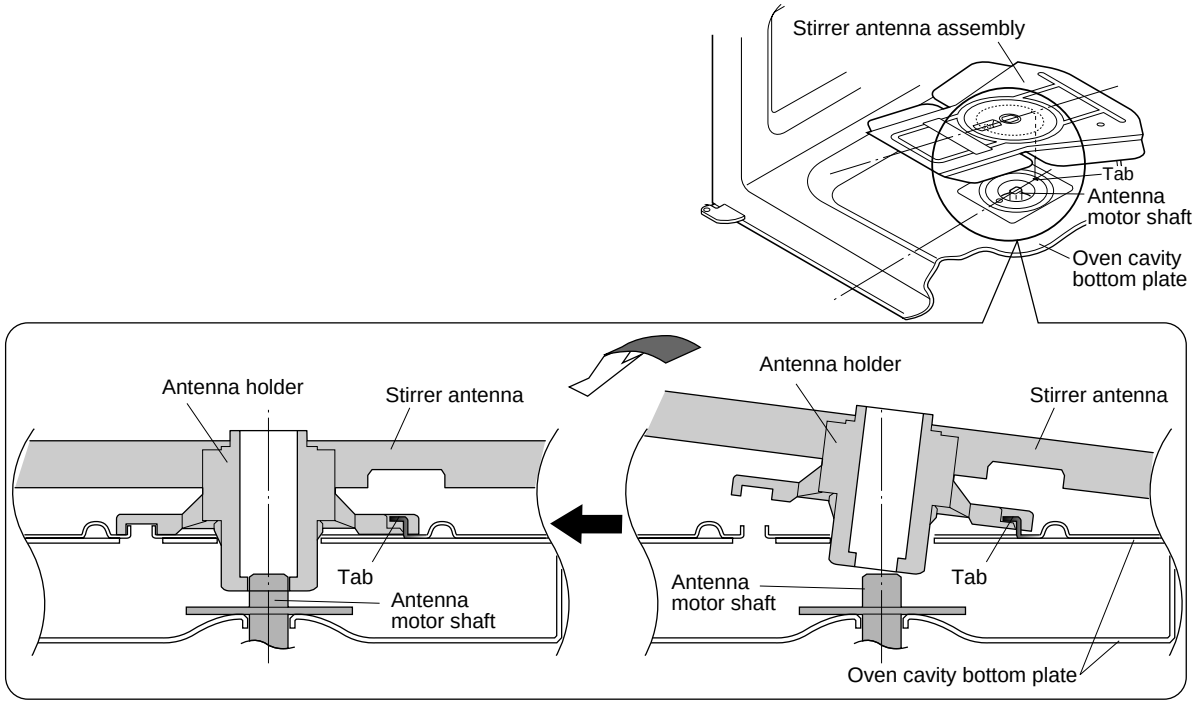


Figure C-10. Stirrer Antenna Assembly Installation

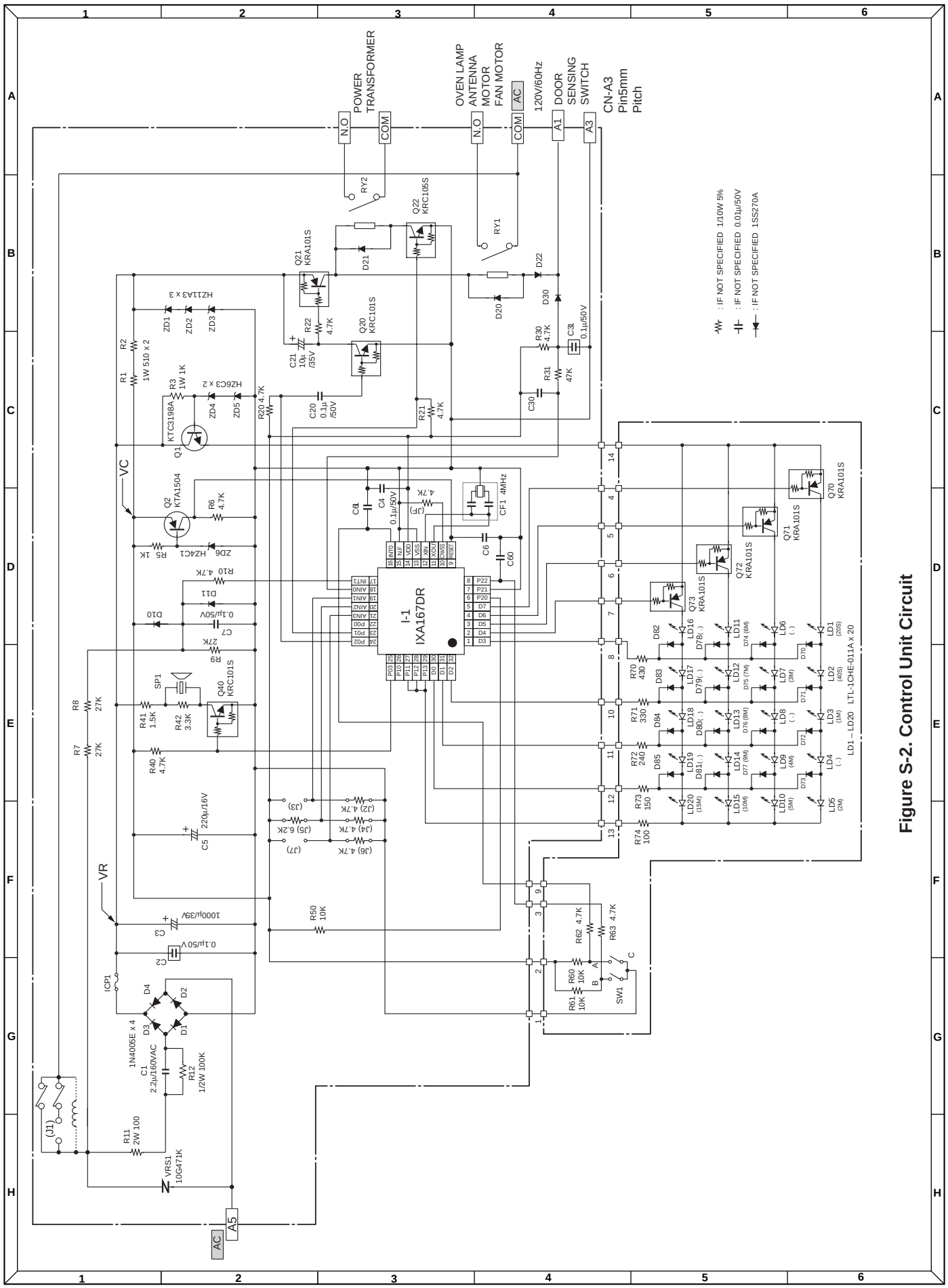


Figure S-2. Control Unit Circuit

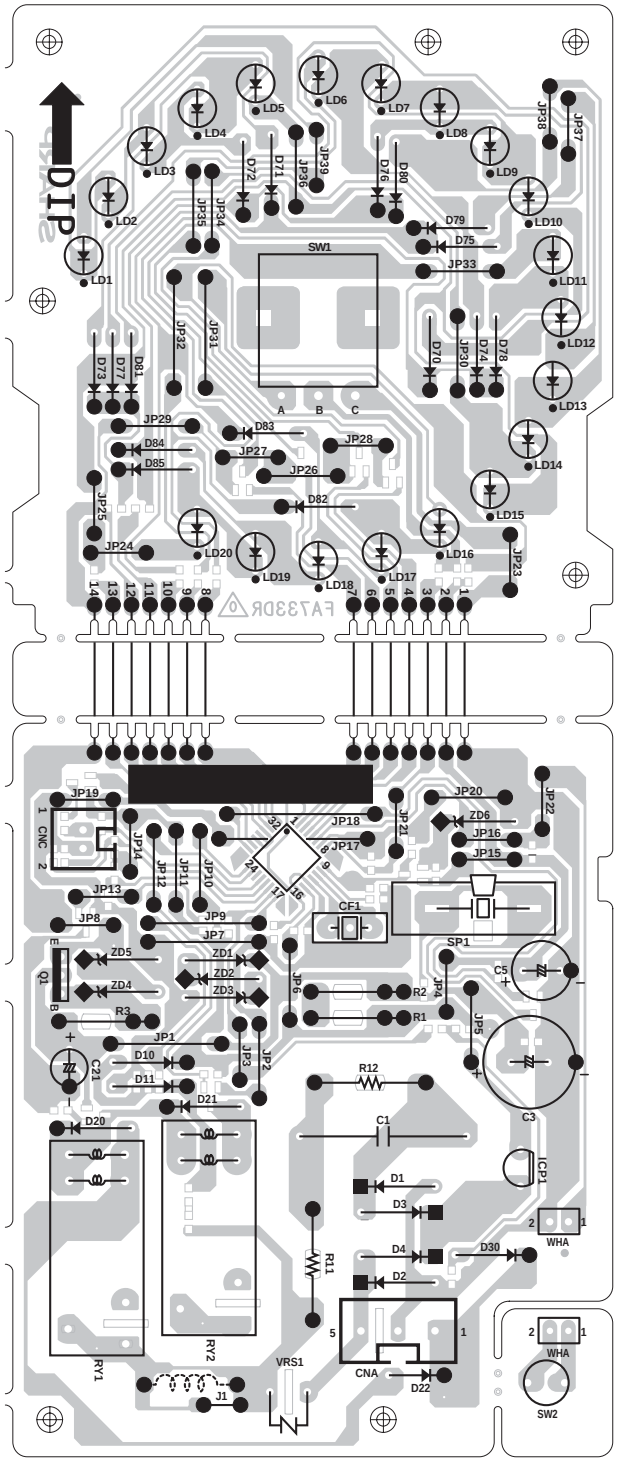


Figure S-3. Printed Wiring Board

PARTS LIST

Note: The parts marked "Δ" may cause undue microwave exposure.
The parts marked "*" are used in voltage more than 250V.

	REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
			ELECTRIC PARTS		
	1- 1	FFS-BA015WRK0	Monitor fuse and monitor switch assembly	1	AK
	1- 2	QSW-MA051WRE0	Door sensing switch	1	AF
	1- 3	QSW-MA135WRE0	Secondary interlock switch	1	AH
	1- 4	FACCDA078WRE0	Power supply cord	1	AV
*	1- 5	FH-DZA084WRK0	High voltage rectifier assembly	1	AV
*	1- 6	RC-QZA242WRE0	High voltage capacitor	1	AV
*	1- 7	RMOTEA376WRE0	Fan motor	1	AU
	1- 8	QFSHDA009WRE0	Fuse holder	1	AG
	1- 9	QSOCLA021WRE0	Oven lamp socket	1	AG
	1-10	RLMPTA072WRE0	Oven lamp	1	AY
	1-10	RLMPTA030WRE0	Oven lamp (Interchangeable)	1	AE
	1-11	RMOTDA233WRE0	Antenna motor	1	AQ
	1-12	RTHM-A080WRE0	Thermal cut-out 145 deg. (MAG)	1	AP
	1-13	RTHM-A096WRE0	Thermal cut-out 125 deg. (OVEN)	1	AK
*	1-14	RTRN-A570WRE0	Power transformer	1	BM
Δ*	1-15	RV-MZA197WRE0	Magnetron	1	BN
			CABINET PARTS		
	2- 1	GCABUA674WRP0	Outer case cabinet	1	AX
	2- 2	GDAI-A311WRW0	Base plate	1	AS
	2- 3	GCOVHA406WRW0	Base plate cover	1	AQ
	2- 4	GLEGPA074WRE0	Foot	2	AC
	2- 5	GLEGPA076WRF0	Leg	1	AF
			CONTROL PANEL PARTS		
	3- 1	DPWBFC288WRUZ	Control unit assembly	1	BF
	3- 2	FPNLCB434WRK0	Panel sub assembly	1	BA
	3- 2-1	HPNLTA137WRE0	Timer sheet	1	AH
	3- 2-2	GCOVAA260WRP0	C/P case	1	BA
	3- 3	TCAUAA076WRR0	User caution label	1	AB
	3- 4	JKNBKA606WRM0	Timer knob	1	AL
	3- 5	XEPSD30P08XS0	Screw; 3mm X 8mm	5	AA
			OVEN PARTS		
	4- 1	FGLSPA062WRE0	Ceramic shelf	1	BL
Δ	4- 2	**********	Oven cavity (Not a replaceable part)	1	—
Δ	4- 3	MLEVPA227WRF0	Latch switch lever A	1	AF
Δ	4- 4	MLEVPA228WRF0	Latch switch lever B	1	AF
Δ	4- 5	MLEVPA229WRF0	Latch switch lever C	1	AF
Δ	4- 6	MSPRCA108WRE0	Latch lever spring	3	AC
Δ	4- 7	MSPRTA191WRE0	Switch lever B spring	1	AC
Δ	4- 8	PHOK-A121WRFZ	Latch hook	1	AG
	4- 9	FDUC-A341WRY0	Steam duct sub assembly	1	BA
	4-10	PSKR-A351WRP0	Steam guide	1	AY
	4-11	LBNDKA136WRP0	HV capacitor holder	1	AQ
	4-12	NFANJA029WRE0	Fan blade	1	AK
	4-13	PDUC-A697WRF0	Fan duct	1	AM
	4-14	FPLT-A007WRY0	Stirrer antenna assembly	1	BB
	4-15	PCUSGA504WRP0	Insertion cushion	2	AB
	4-16	PSKR-A348WRW0	Insertion plate A	1	AN
	4-17	GCOVHA404WRE0	VCP cap	2	AG
	4-18	LANGFA199WRWZ	Chassis support	1	AH
	4-19	NSFTPA035WRFZ	Antenna motor shaft	1	AQ
	4-20	PCLICA032WRE0	Hand clip 4	5	AD
	4-21	PCLICA033WRE0	Hand clip 5	4	AD
	4-22	PCOVPA344WRF0	Side splash cover	1	AF
	4-23	PCOVPA345WRF0	Back splash cover	1	AF
	4-24	PCUSGA249WRP0	Cushion	3	AA
	4-25	PCUSUA511WRP0	Cushion	1	AC
	4-26	PCUSUA194WRP0	Cushion	2	AC
	4-27	PCUSUA514WRP0	Cushion	1	AB
	4-28	PDUC-A722WRF0	Air intake duct	1	AF
	4-29	PFILWA060WRP0	Lamp filter	1	AD
	4-30	PSHEPA644WRE0	Insertion sheet	1	AD
	4-31	PSKR-A347WRW0	Insertion plate B	1	AL
	4-32	PSKR-A349WRP0	Steam duct barrier	1	AF
	4-33	PSKR-A359WRW0	Air guide	1	AM

REF. NO.	PART NO.	DESCRIPTION	Q'TY	CODE
4-34	PSPA-A112WRE0	Mica washer	1	AC
4-35	PCUSGA378WRP0	Cushion	1	AL
4-36	PCUSUA507WRP0	Cushion	1	AC
4-37	PCUSUA517WRP0	Cushion	1	AE
4-38	PSHEPA674WRE0	Cover	1	AL
4-39	PPACGA171WRE0	Cushion	1	AK
4-40	PSHEPA673WRE0	S/ film	1	AD
4-41	PCUSUA518WRP0	Cushion	1	AC

DOOR PARTS

Δ	5- 1	CDORFA804WRK0	Door assembly	1	BP
Δ	5-1-1	FDORFA322WRT0	Door panel assembly	1	AZ
	5-1-2	PSHEPA649WRE0	Sealer film	1	AB
Δ	5-1-3	FANGKA206WRY0	Latch angle assembly	1	AW
	5-1-4	FCOV-A002WRK0	Door case assembly	1	BQ
	5-1-4-1	LSTPPA180WRF0	Glass stopper R	1	AK
	5-1-4-2	LSTPPA182WRF0	Glass stopper U	1	AN
	5-1-4-3	PGLSPA516WRE0	Front door glass	1	AU
	5-1-4-4	PSLDMA198WREZ	Sealer plate	1	BB
	5-1-4-5	XCPSD40P08000	Screw : 4mm x 8mm	6	AA
	5-1-5	GWAKPA580WRM0	Door handle	1	AQ
	5-1-6	JHNDMA040WRW0	Handle lever	1	AN
Δ	5-1-7	LANGKA874WRW0	Latch lever	1	AR
Δ	5-1-8	LSTPPA181WRF0	Latch head	2	AL
	5-1-9	MSPRTA190WRE0	Latch spring	1	AD
	5-1-10	PCUSUA506WRP0	Cushion	1	AC
	5-1-11	XEPSD40P06000	Screw : 4mm x 6mm	1	AB
	5-1-12	PSHEPA686WRE0	Panel sheet	2	AK
	5-1-13	PSHEPA687WRE0	Panel sheet	1	AK
	5-1-14	PCUSGA514WRP0	Cushion	1	AK
	5-1-15	PCUSUA505WRP0	Cushion	1	AC
	5-1-16	XEPSD40P08000	Screw : 4mm x 8mm	4	AB
	5-1-17	XEPSD40P25K00	Screw : 4mm x 25mm	2	AB
	5-1-18	PCUSUA508WRP0	Cushion	1	AC
	5- 2	GCOVHA407WRF0	Choke cover	1	AM
	5- 3	HBDGCA107WREZ	Door badge	1	AL

MISCELLANEOUS

6- 1	TINSEA954WRRZ	Instruction book	1	AM
6- 2	FW-VZB684WRE0	Main wire harness	1	BB
6- 3	TCAUAA166WRR0	DHHS caution label	1	AB
6- 4	TCAUAA241WRR0	Monitor caution	1	AE
6- 5	TCAUAA243WRR0	Earth caution	1	AC
6- 6	TCAUAA245WRR0	Cover caution	1	AC
6- 7	TMAPCA759WRR0	Schematic diagram	1	AE
6- 8	LHLDWA013WRE0	Purse lock LL	1	AC
6- 9	TCAUAA249WRR0	Caution label	1	AE

SCREWS,NUTS AND WASHERS

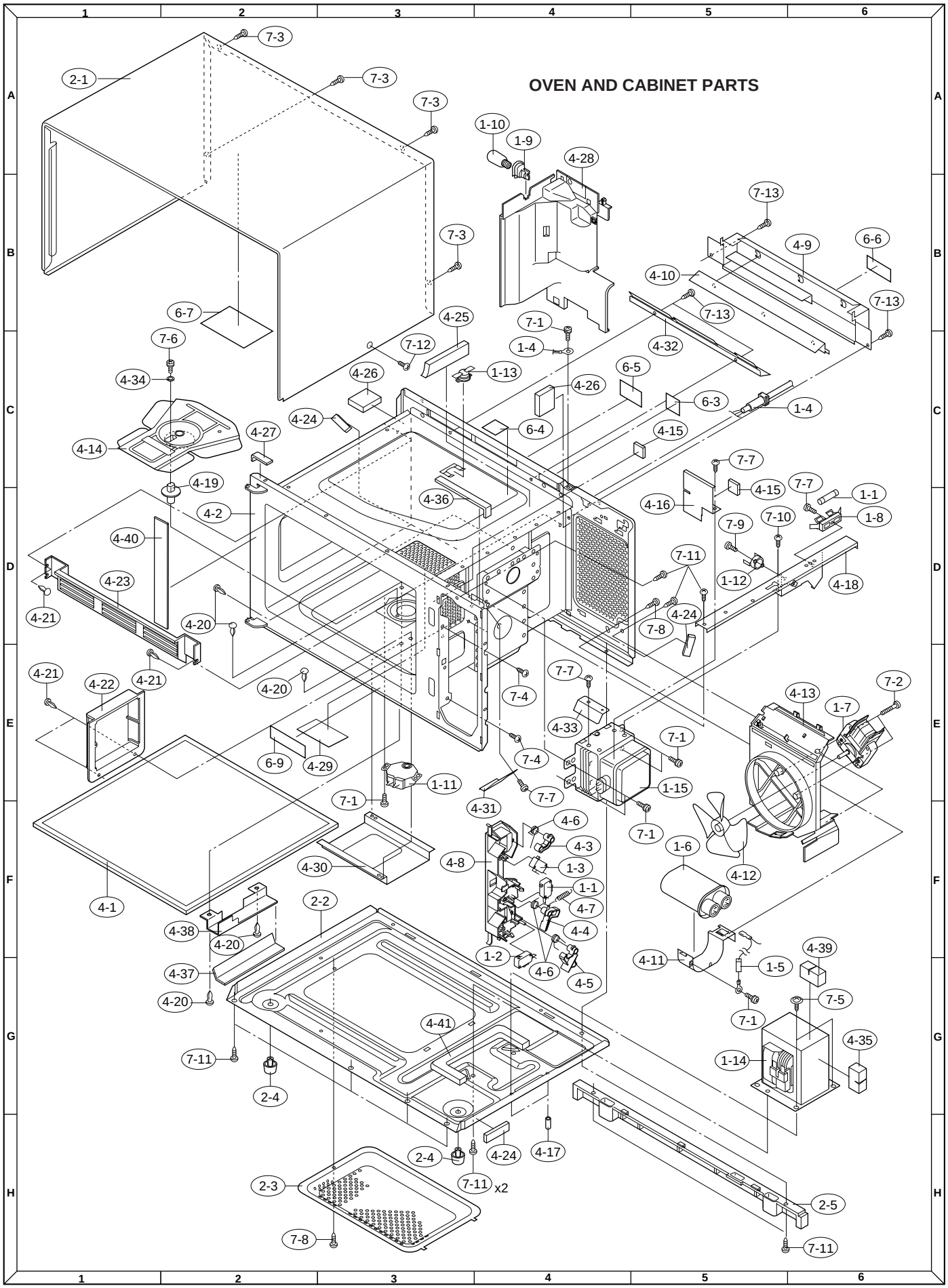
7- 1	XHPSD40P08K00	Screw : 4mm x 8mm	7	AA
7- 2	XEPSD40P25000	Screw : 4mm x 25mm	2	AA
7- 3	LX-CZA038WRE0	Special screw	4	AA
7- 4	LX-CZA052WRE0	Special screw	2	AA
7- 5	LX-EZA042WRE0	Special screw	2	AB
7- 6	XBPWW40P04000	Screw : 4mm x 4mm	1	AB
7- 7	XFPSD40P08000	Screw : 4mm x 8mm	4	AA
7- 8	XHTSD40P08000	Screw : 4mm x 8mm	2	AB
7- 9	XHPSD30P06000	Screw : 3mm x 6mm	1	AA
7-10	XHTSD40P08RV0	Screw : 4mm x 8mm	1	AA
7-11	XOTSD40P12000	Screw : 4mm x 12mm	12	AA
7-12	XOTSF40P08000	Screw : 4mm x 8mm	1	AA
7-13	XOTWW40P10000	Screw : 4mm x 10mm	4	AA

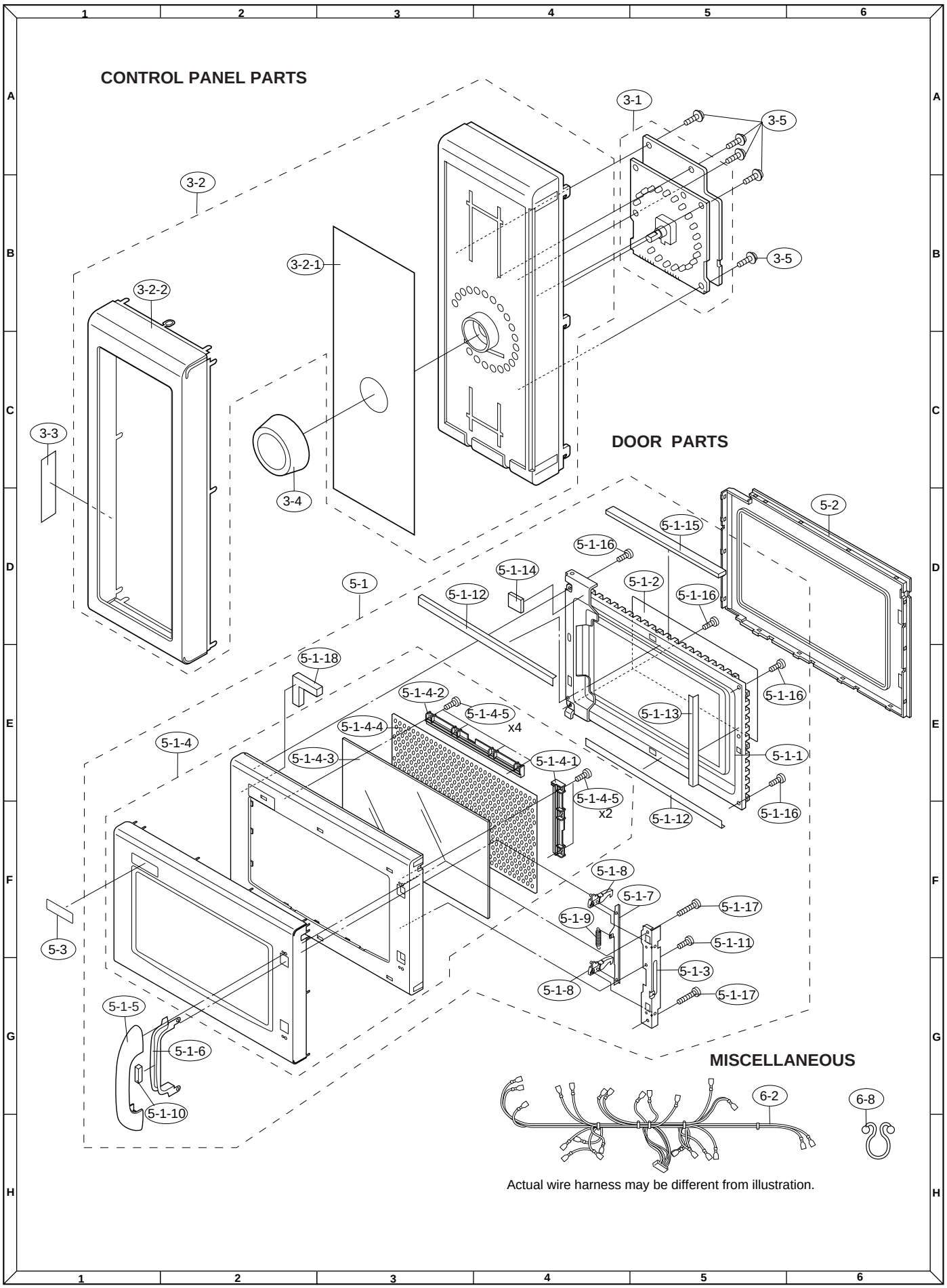
HOW TO ORDER REPLACEMENT PARTS

To have your order filled promptly and correctly, please furnish the following information.

1. MODEL NUMBER 2. REF. NO. 3. PART NO. 4. DESCRIPTION

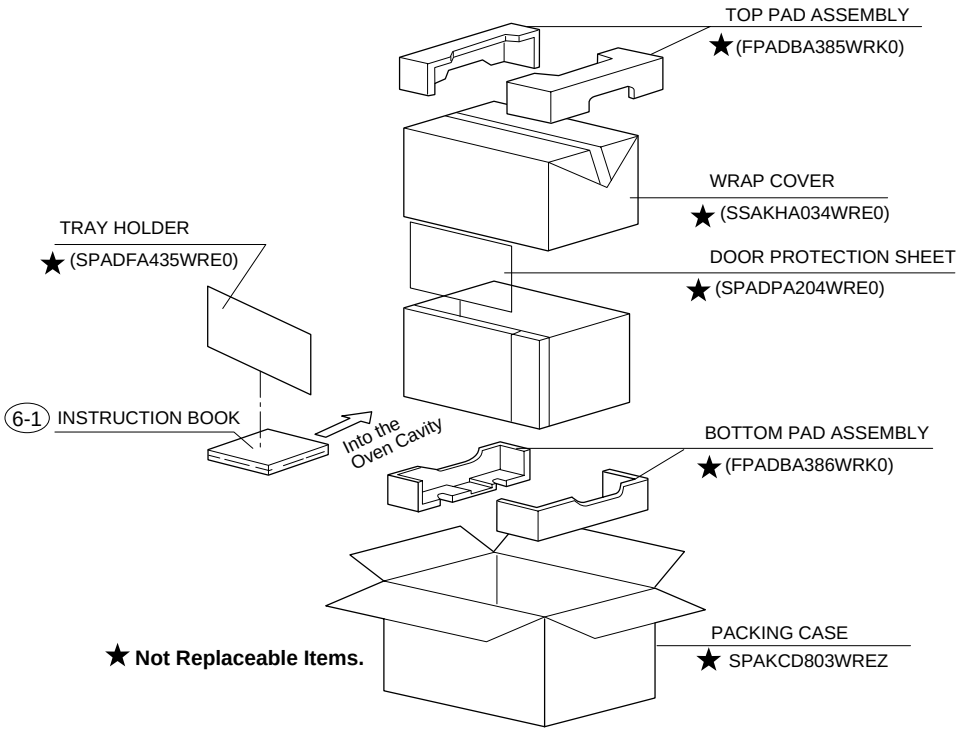
Order Parts from the authorized SHARP parts Distributor for your area.
Defective parts requiring return should be returned as indicated in the Service Policy.


OVEN AND CABINET PARTS
1
2
3
4
5
6
A
B
C
D
E
F
G
H
7-3
2-1
7-3
7-3
1-10
1-9
4-28
7-13
4-9
6-6
4-10
7-13
7-13
4-32
7-3
6-7
4-25
7-1
1-4
7-6
7-12
4-26
1-13
4-26
6-5
4-34
6-3
1-4
4-24
6-4
4-15
4-14
4-27
7-7
4-19
4-15
7-7
1-1
4-36
4-16
1-8
4-2
7-9
7-10
4-40
7-11
4-23
1-12
4-18
4-21
4-20
4-24
7-8
4-21
4-22
4-21
7-7
4-13
1-7
7-2
4-20
7-4
4-33
7-1
6-9
4-29
7-4
1-15
1-11
7-1
7-7
4-31
7-1
4-6
1-6
4-30
4-8
4-3
4-12
1-3
4-1
1-1
2-2
4-7
4-38
4-20
4-4
1-2
4-6
4-11
4-39
4-37
4-5
1-5
4-20
7-5
7-1
4-41
4-35
7-11
1-14
2-4
4-17
4-24
2-4
7-11
x2
2-3
2-5
7-8
7-11



Actual wire harness may be different from illustration.

PACKING AND ACCESSORIES



SHARP

COPYRIGHT © 2002 BY SHARP CORPORATION

ALL RIGHTS RESERVED.

No part of this publication may be reproduced, stored in retrieval systems, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission of the publisher.

'02 SHARP CORP. (8S0.730E) Printed in U.S.A